

What is claimed is:

1. An individual lead acid battery cell having an electrolyte that includes sulfuric acid, said battery cell comprising:

- 5 a first containment having a first container and a first cover, said electrolyte being contained within said first containment;
 positive and negative electrodes within said first containment and in contact with said electrolyte;
 positive and negative posts electrically connected to respective said
10 positive and negative electrodes and extending through said first containment;
 a gas space within said first containment in which oxygen and hydrogen gasses may collect; and
 a second containment having a second container and a second cover, said first containment being disposed within said second containment, said
15 second containment being leak proof in that when it is in its upright position it can hold all of said electrolyte should said first containment leak, and said second containment having sufficient strength so as not to rupture in the event of an explosion of said gasses within said first containment.

- 20 2. The cell of claim 1 wherein said second containment is fire proof.

3. The cell of claim 2 further comprising:
 a vent device extending sealingly through said first containment and
25 further through said second containment through which gas from said gas space can exit said cell.

4. The cell of claim 3 wherein said vent device comprises a pressure relief valve for allowing said gas to exit said cell only when a
30 pressure of said gas exceeds a predetermined amount.

5. The cell of claim 2 wherein said cover of said second containment is a separate member connected to said second container.

6. The cell of claim 2 wherein said second containment includes holes through which said posts extend, said holes being larger than said posts so that said posts do not electrically contact said second containment.

5 7. The cell of claim 7 further comprising an electrically insulating material disposed in said holes to prevent electrical contact between said posts and said second containment .

8. The cell of claim 8 wherein said insulating material comprises an
10 insulating collar.

9. The cell of claim 2 wherein an outside dimension of said first containment is smaller than an inside dimension of second containment so as to form a gap between said containments.

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10. The cell of claim 10 wherein said gap is filled with an insulating material.

11. The cell of claim 2 wherein said first containment and said
20 second containment are physically attached to one another.

12. The cell of claim 1 comprising a vent device extending sealingly through said first containment and further through said second containment, said vent device having a pressure relief valve for allowing fluid within the first
25 containment to exit said cell only when a pressure of said fluid exceeds a predetermined amount, said fluid comprising any of said gas and said electrolyte.

13. The cell of claim 12 wherein said predetermined amount is no
30 less than a head pressure of said electrolyte when said cell is inverted such that the head pressure is exerted against said pressure relief valve.

14. The cell of claim 1 further comprising a gap between at least portions of said first and second containments.

15. The cell of claim 1 further comprising insulation between said first and second containments.

5 16. The cell of claim 2 wherein said second containment is made of steel and said first containment of a plastic.

17. The cell of claim 1 wherein said covers of said first and second containments are attached as a unit to said containers of said first and second
10 containments.

18. The cell of claim 1 comprising multiple said cells attached together to form a single mass of cells.

15 19. The cell of claim 1 further comprising;
a spring and damper configured for controlling any horizontal movement of said cell.

20. The cell of claim 1 further comprising a porous material
20 disposed within said gas space capable of attenuating an explosion of the gasses within said gas space.

21. The cell of claim 1 wherein a cover of said inner containment is configured to minimize a volume of said gas space.

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22. The cell of claim 1 further comprising:
a gap between said first and second containments, said gap receiving cooling fluid for cooling said cell.

30 23. An individual lead acid battery cell having an electrolyte that includes sulfuric acid, said battery cell comprising:
a first containment, said electrolyte being contained within said first containment;

positive and negative electrodes within said first containment and in contact with said electrolyte;

a gas space within said first containment in which oxygen and hydrogen gasses can collect; and

5 a second containment that is non-flammable, said first containment being disposed within said second containment, said second containment being leak proof in that when it is in its upright position it can hold all of said electrolyte should said first containment leak, and said second containment having sufficient strength so as not to rupture in the event of an explosion of
10 said gasses within said first containment.

24. The cell of claim 23 wherein said first containment is made of plastic and said second containment is made of steel.

15 25. The cell of claim 24 further comprising a vent device extending through said first and second containments through which gas from said gas space can exit said cell, said vent being sealingly connected to said first containment.

20 26. The cell of claim 23 wherein said first containment includes a container and a cover, and said second containment includes a container and a cover, said covers of said first and second containments being attached as a unit to said containers of said first and second containments.

25 27. The cell of claim 26 wherein said covers of said first and second containments are clamped to said containers of said first and second containments.

30 28. The cell of claim 24 wherein said first containment comprises a container of one type of plastic, and a cover of another type of plastic.

29. The cell of claim 24 comprising at least one lifting eye attached to said second containment.

30. The cell of claim 23 further comprising a foam having cells for attenuating an explosion.

31. The cell of claim 30 having an open cell foam.

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32. The cell of claim 30 having a closed cell foam.

33. An individual lead acid battery cell having an electrolyte that includes sulfuric acid, said battery cell comprising:

10 a first containment, said electrolyte being contained within said first containment;

 positive and negative electrodes within said first containment and in contact with said electrolyte;

15 a gas space within said first containment in which oxygen and hydrogen gasses can collect;

 a second containment that is non-flammable, said first containment being disposed within said second containment, said second containment being leak proof in that when it is in its upright position it can hold all of said electrolyte should said first containment leak; and

20 means for making said cell explosion proof.

34. The cell of claim 33 wherein said means for making said cell explosion proof comprises said second containment being of sufficient strength so as not to rupture in the event of an explosion of said gasses within
25 said first containment.

35. The cell of claim 34 wherein said means for making said cell explosion proof includes minimizing said gas space so as to minimize a volume of gasses that can explode.

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36. The cell of claim 34 wherein said means for making said cell explosion proof comprises an open or closed cell foam disposed in said gas space.

37. The cell of claim 23 wherein side ends of said positive and negative plates are positioned no more than about $\frac{1}{4}$ inch from a side of said first containment.